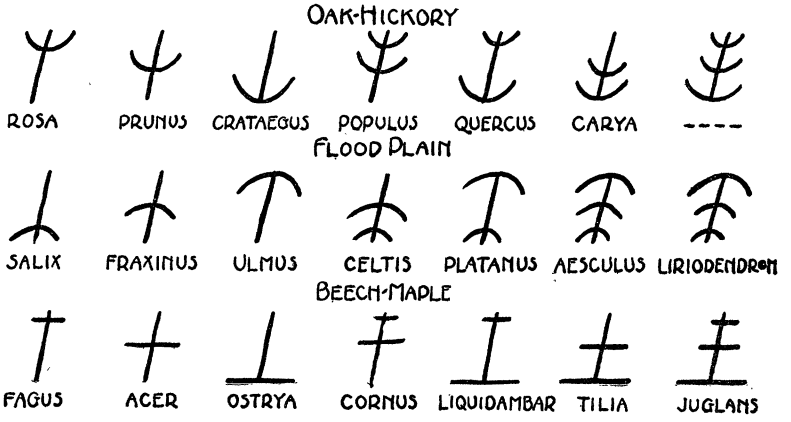
VEGETATION MAPPING

THE value of accurate maps of native vegetation as a basis for very practical generalizations can not be questioned. It is obvious that an essential condition for getting accurate maps of large areas is the existence of precise maps of smaller component ones. At present very few precise local maps are available, but it is to be hoped that botanists throughout the country will begin to supplement the efforts of a few of their number who are doing map work of permanent and general value.



The workers who have contributed our various large area maps doubtless realize better than any one else the impressionistic nature of their final product. In most cases these men have done the utmost possible with scanty and vague local data. There have been, however, a few instances of buoyant disregard of the deadly principle of accumulation of error which ought not to have happened. One author, mapping a fairly large area, secured local data from a source whose authority few would care to question and then from his distant vantage point cut and trimmed until, speaking mildly, the accuracy of a considerable sector of his map was seriously impaired.

In preparing careful local maps of vegetation the question of procedure varies greatly, and is seldom an easy one. The two sources of help outlined below have been put to rather careful tests, and are presented not because of any imagined novelty but because they may prove useful to other workers under suitable conditions.

In original surveys of the forested states by government engineers the bearing trees at section corners were often listed by species, while field notes of transects present an orderly panorama of forest types passed through on each mile. The first Ohio surveys were generally done by trained woodsmen, and exhaustive field checks show that their specific determinations of trees may be pretty generally relied upon. Happily, too, there have been few serious errors in running lines—certainly nothing like the gross blunders of some of the surveyors of a later day who worked in states farther west. When one considers the genuine hardships and dangers unconsciously revealed by the field notes covering the Connecticut Western Reserve (done before 1800), for example, the excellence of the work is remarkable.

A means of utilizing these notes has been worked out after some experiment, and combines economy of time with accuracy. A set of arbitrary generic symbols was devised which could be logically grouped and readily memorized. Three typical series of symbols are shown in the accompanying table. They consist of familiar units of penmanship and can be written without much effort, while their number can be increased to cover almost

any problem without a great deal of inventiveness. Where necessary to indicate species an initial following the symbol does very well.

Using these symbols the species of bearing trees at each section corner can be transcribed onto a sheet of cross section paper with one centimeter or quarter inch squares. Where correspondence between original and modern surveys is sufficiently close it is sometimes convenient to transcribe directly upon a county road map or topographic sheet, as this gives a ready guide for field checking. With an assistant reading locations and species it was found that an average county in Ohio could be transcribed in from thirty to forty-five minutes, while one man working alone could do the job in one or two hours.

If, for publication or other reasons, a map in colors is desired, distinctive colors can be assigned to each series, and the various shades of these colors to the important species of the respective series. The symbols may then be transcribed by means of properly colored dots upon two millimeter cross section paper.

Finally and most important, it has been amply demonstrated that this network of specimen trees at one mile intervals affords a *workable* map of native vegetation, even within an area twenty miles square. One concrete instance of the usefulness of such a map within the Erie Basin of Ohio may be cited. The climax forest of glaciated Ohio is beech-maple, but there are considerable areas whose native vegetation is oak-hickory and also prairie. The map in question revealed with great promptness a correlation whose significance the reader may judge for himself; the beech-maple covers what was upland during the recession of the postglacial lake, the oak-hickory coincides with the great shallow bays formed at various stages of recession, and prairie (with occasional bog centers) marks clearly the deeper baymouths. These facts of course become especially illuminating when taken in connection with the events of to-day, patent in and about Sandusky and Maumee bays.

II

While stationed at Dorr Field, Arcadia, Florida, in 1918, the writer had excellent opportunity to test the utility of the airplane as an aid in vegetation reconnaissance and mapping. It goes without saying that experience of this sort came as a by-product of other duties which fairly filled the time.

There are two basic facts to emphasize in connection with airplane reconnaissance—first, the tremendous increase in perspective made possible, and second, the fact that each type of vegetation preserves its distinctive shade of color, and often a distinctive texture, so long as it remains visible.

Granted that vegetation types are distinctive in shade and texture from considerable altitudes, one has only to examine mosaic airplane maps made with one of the excellent automatic cameras now available to realize that this method can be just as useful for mapping vegetation as for locating gunpits or analyzing topography. Because of the cost it is not likely that extensive photographic maps will often be undertaken by individuals, but pressure from individuals may be highly instrumental in getting organized agencies to undertake methodical mapping of this kind while native vegetation still remains.

For reconnaissance mapping, however, the airplane should be of great service to the individual. The ecologist who is engaged in studying a given region ought to pause to balance the time he will spend in planning and later in piecing together isolated field studies to get their broad interpretation *against* the expense involved in taking two thirty-minute flights over the region. A minimum of two flights has been suggested because the first would permit intelligent planning of field studies while the second, taken at the conclusion of these studies, would permit their proper synthesis and criticism. Since expense is not the only objection that is likely to arise, it may not be amiss to mention that straight flying is uniformly a delightful experience and that notetaking or even map sketching can be performed with ease inside of the cockpit.

The first flight in the Dorr Field region suggested clearly the essential relations between pine flatwoods, palmetto scrub, and prairie. These relations would have developed very slowly from field studies alone, as the forms of various areas were often misleading when viewed from ground level, and significant differences of contour were matters of inches rather than feet. From the air it seemed obvious that a key to the situation lay in the rainy season water levels. The prairies were observed to form a continuous system—the pathway of broad, shallow rainy season drainage lines—the palmetto scrub formed a fringing zone that might be occasionally flooded, while the pine flatwoods marked the true uplands. The truth of these first suggestions was conclusively fixed by subsequent field work and flights in both rainy and dry seasons. Incidentally, combined ground and aerial studies forced serious doubt of the true climax nature of the pine flatwoods, which seemed in a number of places to be suffering invasion by mesophytic dicotyl forest. It was a matter of some interest to learn later that this inference was borne out by unpublished data of two other botanists working on different parts of the peninsula.

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SCIENTIFIC EVENTS

THE SYSTEMATIZATION OF PLANKTON INVESTIGATIONS

THE following notice has just been received from Professor L. Joubin (Institut Océanographique, 195 Rue Saint-Jacques, Paris) the secretary of the subsection of biological oceanography of the International Union of Biological Sciences, International Research Council.

An international meeting of the delegates of the national sections was held at Paris on January 27, 1921, under the presidency of the Prince of Monaco. At this meeting it was agreed that the study of plankton is not progressing as well as might be desired, because the methods of investigation vary and therefore can not give comparable results. There is need for standardizing the fundamentals of these methods by means of the preparation of a manual which will systematize them while at the same time leaving to each investigator a free hand to perfect and to complete them. These improvements would be taken into consideration in future editions. A circular will be sent to all naturalists (zoologists, botanists, physiologists and chemists) and institutions interested and they will be requested to have it reprinted in the scientific journals and distributed among those interested in oceanography, as well as to solicit opinions, advice, criticism, and observations of any kind. A committee was named to prepare the manual and to bring the plan before the meeting of the subsection of biological oceanography in December, 1921. Specialists who desire to participate in the commission for plankton studies are requested so to inform the secretary. It is requested that all replies, printed matter, data concerning capture, instruments, fabrics, nets, reagents, preservation, and technical methods of all kinds be addressed to the secretary.

AUSTIN H. CLARK

MADAME CURIE'S VISIT TO AMERICA

(From a Correspondent)

MADAME MARIE CURIE, of Paris, the student of radium, will visit this country in May as a guest of the women of America. She will bring with her her two daughters, the elder of whom is also a scientist.

Madame Curie, internationally known for her studies on radium and its application as a remedial agent for cancer, is one of three unusually gifted daughters of a Polish educator. One of her sisters is principal of an important young women's school in Warsaw and the other is director of a large sanatorium in the Galician mountains. Madame Curie went to Paris from Warsaw as a young woman to study in the Sorbonne, and while in Paris married the brilliant physicist and student of radium, Professor Pierre Curie, who met a tragic death by accident in a Paris street in 1906. She is now a teacher in the Sorbonne